Identifying obstacles to a multidisciplinary understanding of 'disruptive' behaviour

Identifying obstacles to a multidisciplinary understanding of 'disruptive' behaviour

Current literature on disruptive or disturbing behaviour in young people tends not to cross-disciplinary boundaries. Some research from within the field of educational studies does acknowledge the existence of brain-based studies, particularly in relation to Attention Deficit Hyperactivity Disorder (ADHD) (e.g., Armstrong 2006). However the detail of such studies is not engaged with in any depth; either they are mentioned in passing as 'interesting and promising' (Cooper 2006: 252) or the basic assumptions underpinning such an approach is critiqued. A recent edited volume on ADHD (Lloyd, Stead and Cohen 2006) contains references to neurological perspectives but does not include a chapter from an authority in this area. Similarly, the majority of the literature in the health and medical sciences makes no mention of sociological perspectives.

Disruptive behaviour is a social event that will have meaning(s) for the individual and be made sense of by those around her in different ways. But the tendency to behave in such a way may well be related to particular neural structures and patterns of activity as well as a host of other factors. The question of what causes a 14 year old pupil to swear and spit at his teacher and rip things from the wall as he exits (loudly) the classroom cannot be answered solely by neuropsychological test scores, functional Magnetic Resonance Imaging (fMRI), in-depth interviews with pupil and teacher, examining the curriculum, assessing the ethos of the school, taking a developmental history, studying the physical space involved, analysis of diet, observation of peer interactions, asking the young man to make a collage of how he was feeling at the time, nor by inviting him to engage on an auto/ethnographic study. None of these methods alone will provide the full picture of why that behaviour and why then. What they will do is address different levels of analysis of the incident – some at the microscopic level of genetic profile, some at the level of neural networks, and so on up to the widest frame offered by educational sociology, an examination of the social world. The key point here is that at each of these levels what counts as data and the best way to gather or generate those data will be different. Different approaches are not in competition but are seeking to explain different things– a scan from an fMRI

cannot tell us what it feels like to be the 'disruptive' pupil, similarly talking with the young man will not reveal atypical patterns of brain activity. Working across disciplinary boundaries will require a common understanding of the nature of the knowledge created or discovered through each discipline and what it can offer.

This paper examines the challenges presented by multidisciplinary approach to the study of behaviour of young people, which causes adults concern. The emphasis on problematic behaviour is important as there has very recently been significant progress in the emerging field, which has become known as 'neuroeducation' more generally (Howard Jones 2009). The potential of neuroscience to inform and enhance classroom practice has been generally well received. Indeed in many cases the neuroscientists are asking for teachers to take a much more critical stance towards various brain based explanations (Della Sala 2007). It should be noted that not all are uncritical advocates, for example Bridges (2009) questions whether the current enthusiasm for the application of 'science' to education might be to by-pass the 'inconvenience' of pupil and teacher experience. Despite the developments in neuroeducation generally there has been slower progress in developing multidisciplinary approaches to the investigation of behaviour problems. Some possible reasons for this are explored below. In this paper it will be argued that whilst a multidisciplinary approach is to be welcomed, work needs to be done in order to ensure that educational research joins the discussion as an equal partner.

The first section offers a demonstration of how big the gaps are between different approaches to understanding disruptive behaviour and the styles of writing typical in these approaches. This is done through a consideration of the contribution of studies in educational sociology that take a 'soft' qualitative approach to research, and in neuropsychology, a 'hard science'. The degree of divergence between these two approaches is then highlighted through a discussion of the 'medicalisation' of disruptive behaviour. Following that the concern that educational research may be treated as a 'poor relation' will be examined, with a focus on the underlying epistemological issues. Having identified some of the challenges facing interdisciplinary research some initial suggestions regarding basic requirements for successful work of this kind will be proposed.

It is important to note that this paper concerns the challenges to multidisciplinary *research* into disruptive behaviour. It is not within the scope of this paper to examine the *practice* of multidisciplinary work with young people with disruptive behaviour. This is of course not to down-play the importance of practice. The primary motivation for developing multidisciplinary research in this area must be to inform practice. A more robust understanding of the characteristics and experiences of young people whose behaviour gives adults cause for concern, one which draws on many varied sources of information, will provide practitioners with information that allows them to develop appropriate interventions and support. It is also worth noting that in practice there are some very positive examples of multi-agency work in this field (Pirrie et al 2009), despite the significant challenges which have been identified (Sloper 2004, Milbourne 2005).

Before embarking on the main argument, a note about terminology is required. The title of this paper refers to 'disruptive behaviour', but as readers of this journal will be only too aware, the use of language in this area is something of a minefield (e.g. Soles et al. 2008). The use of the term 'social, emotional and behavioural difficulties' (SEBD) is fraught with difficulties: it is a subjective term; it has been considered too vague to have any real meaning and it overlaps with other labels. The statement that a particular child 'has' SEBD does not give any clear indication of how the child might behave or what the reasons for the behaviour might be. O'Brien (2005) argues that SEBD and similar labels such as 'Emotional and Behavioural Difficulties' (EBD) are 'generalised umbrella terms'. As such they include young people who exhibit both externalising and internalising behaviour, that is those who are described as 'challenging' as well as young people who may be described as 'vulnerable'.

The lack of conceptual clarity is not helped by the plethora of related terms and more recently the increasing numbers of related medical syndromes or conditions being identified (Lloyd 2003). Labels such as 'disaffected', 'disengaged', 'disruptive, 'delinquent', 'challenging', 'troubled and troubling', and disorders including ADHD, Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) all have a degree of overlap with SEBD in terms of external behaviour. The relationship between SEBD and mental health is a particularly complex one; the DfE Circular of 1994 (DfE 2004) described EBD as problems not so great as to be classed as mental illness.

However, as Cole et al. observe, 'children said to have EBD will often have significant mental health difficulties…' (2002: 9).

Despite the overlap alluded to above it is important to note the different status of these terms, and three types of labels are identifiable. First, describing a pupil as disruptive or troublesome or withdrawn may well be an individual judgement. Second, for a pupil to be described as having SEBD (or any of its variations), we would expect more than one person to have expressed concern about them and some kind of formal assessment to have been carried out. However what that assessment process involves will vary: there is no 'test' for SEBD. Third, there are labels that signify a 'disorder'. These differ in that, dissenting voices notwithstanding, they relate to recognised medical conditions that have a set of diagnostic criteria and recognised diagnostic tests. It is the first and second groups that seem to me to be of great interest. In multidisciplinary research terms, we know very little about them. Young people labelled as experiencing social, emotional and behavioural difficulties or who are generally disruptive are usually excluded from neuropsychological research projects as they constitute neither a diagnostic group nor a control group. In contrast, much of the sociologically informed research has a focus on these groups who can present great challenges to educational professionals. Of course, one of the unanswered questions, and one which multidisciplinary research might be able to address, is whether we can identify three categorically distinct groups, rather than differences of degree, across a range of dimensions such as individual experience, causation, underlying neurobiology, and effective intervention.

The view from educational sociology

The methods of data collection used in sociological educational research are varied with anything from large-scale surveys to auto/ethnography finding a home within the discipline. In this section the focus is on studies that use qualitative approaches rather than those which use large-scale surveys to try to identify correlations between disruptive behaviour and social facts such as social class, IQ, and gender. Within this branch of educational sociology there has emerged a consensus view of 'special needs' as a social construction rather than an objective fact (Clark, Dyson and Millward 2003). Once this was established the search was on for the motivation

behind this construction. If the special education system was not, as had previously been thought, there to meet the needs of young people, then whose needs were being served?

For example, Ford, Mongon and Whelan's *Special Education and Social Control* (1982) adopts what is often described as a neo-marxist analysis of special education. The basic argument is that special educational provision has developed and expanded in response to the need to control a deviant section of the population who get in the way of the real work of schools, which is producing a labour-force. This control is generally achieved through the attachment of medical diagnoses to individuals. Thus the problem is clearly defined as lying within the child and not the system. Studies of disruptive behaviour which take social class as the key determining variable differ from each other in a number of ways. Disruption can be seen as resulting from resistance to the imposition of schooling, with young people responding to authority by either removing themselves from it (truancy), or rule-breaking. Disruptive behaviour is variously described as the working class rebelling against the school values and creating anti-school values of their own; or, alternatively, it is a simpler case of cultural conflict – the values of the working class bring young people who live according to them into conflict with school systems. The extent to which young people are said to be involved in deterministic reproduction, as opposed to active participation in cultural production (Willis 1977), also varies.

Perhaps the most influential theoretical perspective on current writing in the field of special education, is post-modernism. As its name suggests, post-modernism is a rejection of modernism, the enlightenment project and, 'indeed any integrated or coherent thought system which attempts to find an overall pattern in social structures or historical development' (Green 1994: 72). Within educational research it would appear that of all those who might become attached to the post-modernist label, Foucault has been the most influential. Foucault's work is associated with post-modernism because of his view that knowledge is socially created through the exercise of domination (McCarthy 1990). For Foucault power did not reside simply in the hierarchical (and vertical) structure of society; it is more insidious (and horizontal). Humans are made into subjects through the sciences treating them as objects to study. Science also divides people – psychiatry defines the sane and insane

– and throughout history new ways of being deviant are constantly uncovered and legitimised through scientific 'discovery'. Within the field of special education Foucault's work is most often used to 'rescue' the agency of pupils who attract the 'special needs' label by identifying their resistance, transgression, and opportunities to find other sources of subjectivity (e.g., Laws and Davis 2000).

The attractiveness of Foucault's work for those engaged in research in special education is clear. By making problematic the 'taken-for-granted', new avenues of research have come to the fore (Paechter and Weiner 1996). Within special education this has led to the examination of the role of professionals in creating ways of not being 'normal' (Tomlinson 1982), and the experiences of those not traditionally given a voice have been heard (Davis and Watson 2001). For Paechter and Weiner it is, 'By drawing attention to the importance of the 'local', they [post-modernists] enable the focus to move to inequalities at the micro-level where researchers are in a position to observe different forms of domination and resistance, largely overlooked by macro, modernist perspectives' (1996: 269).

In terms of large-scale empirical research into disruptive behaviour from a broadly sociological perspective (examining not only the 'disruptive' pupils but also their social context), the largest studies, certainly in the UK, have been those commissioned by government. In some of these the focus is on perceptions of levels of school indiscipline, e.g. the 'Discipline in Scottish Schools' research that has been conducted in 1990, 1996, 2004 and most recently in 2009 (Munn, Johnstone and Sharp 2004). A second strand in government-funded research is the evaluation of particular initiatives. For example, in Scotland we have had the evaluation of Restorative Practices (Kane et al. 2006), and in England and Wales, of the Behaviour Improvement Programme, the Primary Behaviour and Attendance pilot and the Secondary Social, Emotional and Behavioural Skills pilot (Hallam et al. 2005; Hallam, Rhamie and Shaw 2006; Smith et al. 2007). What these have in common is a focus on the general pupil population. In the third strand of government funded research the focus shifts to pupils who present a greater than average challenge to the school system. A key project here is that by Daniels et al. (2003) examining the outcomes for young people permanently excluded from school. More recently, and in response to concerns raised in the Steer Report (DfES 2005), research has been

commissioned by the DCSF (Department of Children Schools and Families) into the outcomes for pupils who are permanently excluded from PRUs and special schools (Pirrie et al. 2009). What these studies have in common is an interest in the wider experiences of the young people, and a focus in the findings on the complexity of their lives, on the contingency of outcomes and on the importance of relationships with key people.

It is impossible to summarise the key principles of research in this area and do justice to all approaches. However it is perhaps reasonable to say that much of the work on disruptive behaviour within more qualitative branches of educational sociology is concerned with how individuals make sense of and negotiate the social world (including discourses as well as structural factors) in which they live and addresses the ways in which they may be constrained, (and perhaps be complicit in their constraint), by that world. A neuropsychological perspective on disruptive behaviour, as we shall see below, takes a radically different view.

The view from Neuropsychology

This section of the paper is written in the style associated with work in this discipline. The intention behind writing in this manner is to demonstrate that it is not only the content of what is written which separates the different perspectives, but also the manner of the writing. This section necessarily focuses on studies of young people who are said to meet the diagnostic criteria for one or more of the disruptive behaviour disorders such as ODD, ADHD or CD: young people with disruptive behaviour and/or a label of SEBD/EBD but no diagnosis are generally specifically excluded from studies of this kind.

A deficit in executive function has been associated with a number of disorders including ADHD, schizophrenia, autism, ODD/CD and reading disability (Banaschewski et al. 2005). Of these disorders, it is ODD/CD and ADHD that are most consistently associated with disruptive behaviour. The research in relation to ADHD is extensive, however the origins and pathology of this disorder are not clearly understood (Thapar, O'Donovan and Owen 2005). Kenemans et al. (2005) note that 'it has to be conceded that there is still very limited insight as to what the fundamental deficit(s) is (are) that underlie the various clinical symptoms in AD/HD' (p.60); a

view which is shared with other researchers in the field (Vaidya et al. 2005). While earlier studies on young people with ADHD generated a great deal of evidence in support of a deficit in response inhibition underlying behaviour associated with ADHD (Quay 1997), more recently other explanations have been put forward, such as a deficit in motivation (Oosterlann and Sergeant 1998; Banaschewski et al. 2005) or in strategic planning (Clark, Prior and Kinsella 2000). Other research has suggested that the co-morbidity between ADHD and other conditions has led to deficits being mistakenly attributed to ADHD when they are better explained by the co-morbid condition, (Jonsdottir et al. 2006). However despite these recent developments it is common to encounter assertions in very recent studies that the inability to suppress inappropriate actions (Casey and Durston 2006; Pliszka et al. 2006), or a deficit in executive function more generally (Fugetta 2006) is at the root of ADHD.

The evidence for an executive dysfunction element of ODD/CD is less strong (Banaschweski et al. 2005). The performance of young people with ODD/CD on the Stop task has been 'less robust' than for ADHD in identifying a response inhibition deficit (Oosterlan, Logan and Sergeant 1998) although some studies have found a reduced stop signal reaction time (Albrecht et al. 2005). Rubia et al. (2001) found no impairment in their psychiatric control group on Go/No – Go (GNG), Stop or reversal delay tasks from the MARS battery (Maudsley Attention and Response Suppression Task). On the Tower of Hanoi planning task, those with ODD/CD have been found not to have a deficit (Klorman et al. 1999). Sergeant, Guerts and Oosterlan (2002) did find that performance on Stroop was implicated in ODD/CD as well as ADHD, and Van Goozen et al. (2004) found that a group with ODD performed less well on response perseveration tasks, concluding that those with ODD did not have an executive function deficit but had problems regulating their behaviour under motivational inhibitory conditions. In a test using seven measures of impulsivity Avila et al. (2004) identified two factors which results loaded onto - the first which they termed the strong inhibitory control factor related to performance on Stop, Continuous performance test, Matching familiar items and Circle tracing - this factor did not correlate with ODD, the second factor - resistance to interference - which the Wisconsin Card Sorting Task and efficiency in the DRL (differential reinforcement of low rate responding) task loaded onto, was only slightly correlated with ODD.

Studies which have used functional MRI (fMRI) have identified differences (reduced activation, increased activation, and/or engagement of different areas) between brain activity in young people with ADHD compared with normal controls. These differences are located in the prefrontal and striatal regions (Vaidya et al. 2005; Pliszka et al. 2006; Smith et al. 2006). Recruitment of non-typical areas of the brain and underactivation of more typical areas could reflect a delay in development, a deficit in the more commonly used area, anxiety as a result of the demands of the task, or simply a different pattern of brain function. While Smith et al. (2006) found no significant difference in brain activity using Stroop with a group with ADHD, they did find a difference on GNG. Asahi et al. (2004) found that high impulsivity links to reduced activation in right dorsolateral prefrontal cortex on GNG. Bearegard and Levesque (2006) cite previous fMRI studies on GNG tasks with ADHD in which the following areas have been activated: anterior cingulated cortex, dorsolateral prefrontal cortex, orbitofrontal cortex, ventrolateral prefrontal cortex and striatum, in addition under-activation of striatum and prefrontal regions have been observed. The parietal cortex is consistently activated in GNG tasks (Singer and Minzer 2003; Mueller et al. 2006) especially in the right hemisphere and it has been suggested by Hershey et al. (2004) that over-activity is the cause of poor inhibition or a response to failure to inhibit and thus needing to pay more attention next time.

Medicalisation

If the differences between the educational and the neuropsychological approach require further highlighting, then a discussion of the concept of 'medicalisation' will assist. Purdie, Hattie and Carroll (2002) describe the medical approach as one which assumes that there is a norm of behaviour, from which any deviation is viewed as a result of pathology or disease which requires 'treatment'. They go on to argue that problems arise because what counts as 'normal' when applied to expected behaviour in the school context is not fixed. Behaviour which in one classroom may be considered normal, may, in another, lead to referral to an educational psychologist or child psychiatrist for assessment. In recent years there has been an increase in the numbers of young people who are said to have a 'disruptive behaviour disorder'. Prevalence studies of ADHD have found rates ranging from 1% - 20%, with differences between measured rates apparently attributable to methodological rather than cultural differences (Polanczyk et al. 2007). Most literature cites a rate of

between 3 and 5%, although as Purdie et al. (2002) note much higher rates are commonly reported.

Although the deficit or 'medical' model has a long history in special education, it has recently experienced something of a revival, interactionist accounts having dominated in the field of educational studies (Macleod and Munn 2004). There have been a number of attempts to account for the recent return to deficit thinking. Lloyd and Norris (1999) drawing on Slee (1995) suggest that the motivation behind the medicalisation of troubling behaviour is that it creates a 'label of forgiveness' which removes blame – but in which the individual is construed as ill. Tait (2003) expresses concern with the rise in the number of pupils who are said to have some kind of 'disorder', because of the implication that their behaviour is at least in part determined, and as a consequence the extent to which they can be held accountable for their behaviour is diminished. This 'forgiveness' applies to all involved parties, the parents are no longer held accountable on grounds of poor parenting, and the teacher is no longer expected to be able to 'manage' the young person on the same terms as those who have no such redeeming label.

The 'medicalisation of naughtiness', whilst carrying apparent advantage for some interested parties, is a matter of concern. First, as Tait (2003) notes it can lead to the individual not being held responsible for their behaviour, and whilst this may be attractive (particularly to the individual concerned!) in the short term, it has long term consequences for the type of intervention thought to be possible (Macleod 2006). If young people are not held to be accountable for their own behaviour then there would be little point in engaging with them in discussion about their behaviour and the consequences of it. Little point also in engaging the family in any kind of therapeutic or behavioural programme, perhaps to examine the importance of boundaries and routines; if the young person is ill then (it becomes easy to argue) the solution ought to be a medical one. Families and individuals who may benefit from a range of interventions are given leverage to resist anything other than medical intervention. Second, the criteria for the diagnosis of 'conditions' such as ODD rely largely on judgements of behaviour. We know from previous studies that such judgements are highly subjective. For example whether a child is seen as bright and lively or as

having ADHD can be as much a matter of perceptions and assumptions relating to their class background as of observed behaviour (Jacobsen 2002).

Critics of the use of medical approaches to understanding disruptive behaviour often highlight a reliance on rating scales as diagnostic tools as evidence that ADHD is a social construction not medical condition (Cohen 2006). They argue that the robustness of behavioural rating scales as diagnostic instruments can be challenged: many of the criteria can be seen as a matter of opinion. A further complication is that some of the behaviour which may lead to a diagnosis of, for example, ODD may in fact be developmentally appropriate at some stages of development, and although stages are usually related to, they are not tied to, specific chronological ages (Keenan and Wakschlag 2000). In addition the inclusion of 'violating the rights of others' and in some literature 'breaking the law' as a criteria for diagnosis of CD is extremely problematic for some to accept. The concept of 'rights' is as socially constructed as the law - in other cultures or at other times such notions would differ or not exist, thus their use as the basis for diagnosing a disorder implies that the disorder must also be socially constructed. There is no denying that some children and young people behave in more defiant and oppositional ways than others; rather the key difference of opinion is over whether these extremes constitute a medical condition.

The medicalisation of behaviour, which is viewed by some as ‘not normal’, is currently under increased scrutiny as the Diagnostic and Statistical Manual (DSM) is under revision. The DSM is the handbook for psychiatrists, now on its fourth edition, and with each new revision listing more of ways of being ‘disordered’ from 22 in the 1900s to nearly 400 in the most recent version (Background Briefing 2009). The revised edition (DSM–V) is now due for completion in 2013 (Schatzberg 2010), and there is substantial debate about what changes ought to be made. A particular concern relating to disruptive behaviour is the possibility of moving from a categorical (an individual either has or has not got the condition) to a dimensional (the condition is on a spectrum) approach, with the resulting ‘widening of the net’ which this may entail. The most recent news from the American Psychiatric Association seems to confirm these plans to move from categories to symptom severity scales (Swedo 2009).

There is then a clear difference between the portrayal of, and explanation for disruptive behaviour in the neuropsychological and the educational literature. Whilst much of the writing in the former is applied to seeking more accurate 'measures' and identifying the exact nature of the deficit in executive function, or characteristic differences in neural structure and function, in education the debate over the status of disruptive behaviour as a diagnosable medical condition continues, alongside ‘what works’ research seeking to find a successful intervention. Given these differences, how realistic is it to envisage a research programme which drew on these diverse discipline and others in between?

The challenge of interdisciplinary research

At the start of the paper it was suggested that there are three barriers to researchers from within education engaging in multidisciplinary research. These are now discussed in more detail. The first is an apparent crisis of confidence within educational research. This links to the second, the current obsession amongst policy makers and funding councils for a particular kind of quantitative research. Finally, it can be argued that within the education research community there is some distrust (or at least misreading) of much of the medical and psychological research.

In order for educational researchers to argue for the contribution which they can make to a multidisciplinary study there needs to be a degree of confidence in what the discipline can bring to the table, and it is not at all clear that such confidence exists. Research in education has attracted some harsh criticism over recent times but perhaps the most damaging attacks have come from within. Two opposing philosophical positions are seen as underpinning much of the conflict in educational research (Pring 2000), which has recently been re-opened with the advent of the ‘what works?’ research agenda. On the one side are the realists who assert the existence of an objective world existing independently of our knowledge of it. In contrast the relativist camp assert that the world is a social construction; there is nothing ‘out there’ to be discovered. However, much of the recent writing on this polarisation of views is aimed at, if not reconciling, at least narrowing the gap between, them (see, e.g. Bridges and Smith 2007). One attempt to do so is offered by Pring: ‘It is not that there are multiple realities. Rather there are different ways in which reality is conceived, and those differences may well reflect different practical interests and

different traditions' (2000: 254). Other attempts employ the tactic of asserting that their position has been misunderstood. A common theme in the literature from the 'realist' position is that the critique offered by the relativists is of a 'strawman' (Moore and Muller 1999), either adopting a view of scientific method which would be unrecognisable to most scientists, or by equating realism with 'naïve realism' (Collier 1994). Similarly, Laws and Davies (2000) comment that a 'startling mode of dismissal' (2000:206) of the post-modernist view rests in the assertion that for post-modernists there can be no common narratives – an assertion they clearly reject.

The differences between realism and relativisim can perhaps be better understood when their respective 'starting points' are considered. Realists start from an ontological assertion that the material world exists. On the basis of that ontology they build an epistemology in which two key assertions are as follows: first, knowledge can be objective (the things we know exist whether we know them or not); and second, knowledge claims are fallible (it will always be possible that further information will arise which improves our knowledge) (Collier 1994). In contrast, the relativist position starts from theorising about what we can know – that is, epistemology. Within this approach knowledge is viewed as a social construction, with individuals constructing their own knowledge, thus the question of what there really is 'out there' becomes redundant.

An example of the application of realist and anti-realist (or relativist) principles to research in this area is provided by the debate over the 'truth' of ADHD as explored by Tait (2006). In summary he argues that the only way in which the reality of ADHD as 'fact' can be defended is if an anti-realist, specifically a pragmatic, view is adopted, because the theory of ADHD as a disorder 'works'. However, by taking an anti-realist position the 'hard' scientific evidence for the existence of ADHD cannot be admitted. It doesn't help that if this pragmatic view is taken, the contrary view that ADHD is a social construction can also be shown to 'work'. Tait uses this analysis to argue that realists and anti-realists cannot work together, however there is perhaps less cause for despair than Tait seems to think. Tait has chosen to focus on a pragmatic version of anti-realism, one in which 'usefulness' is taken as a substitute for truthfulness (Niiniluoto 1999). However the approach of critical realism, sitting

somewhere between the extremes of realism and anti-realism, may offer a more positive outcome.

According to the critical realist position it is not inconsistent to believe in the existence of an independent external reality and at the same time hold that our knowledge of that reality is always fallible and open to critique and revision (Scott 2005). This is not to suggest that everyone adopt a critical realist perspective, simply to observe that there are routes out of the apparent dualism.

It seems that the long-running dispute within educational research has led to a residual crisis of confidence which is exacerbated by the discourse of a 'gold standard' of research. In this context misconceptions about the authority of 'science' abound and, as demonstrated by Rowbottom and Asiton (2007), this is at least in part sustained by handbooks of educational research. Bridges (2009) has commented on these trends, noting that criteria which are applied to assess 'scientifically-based research' are also being applied to educational research from within the humanities resulting in their systematic exclusion from the accepted evidence base for policy-making. In applying criteria more appropriate to quantitative studies, most qualitative research would fall at the first hurdle: narrative research is not going to pass the test of any power calculation and demanding a 'control group' would be meaningless. However, the data generated by qualitative methods such as narrative research are no less valuable and should generate no less confidence than those produced through randomised control trials (Griffiths and Macleod 2008).

Given this context it has been suggested that educational researchers need to have more confidence in their methods and to reaffirm claims for their discipline to be accepted on its own terms and not be judged against inappropriate criteria (Bridges 2009). This will be particularly the case when educational researchers are working alongside those from more 'scientific' traditions such as in interdisciplinary projects. Ungar (2003) outlines the unique contributions, which he believes qualitative research offers to our understanding of resilience in young people – many of which apply equally well to our understanding of disruptive behaviour. In particular, qualitative research has a role to play in the early stages of research projects when contextual information is what is required. Identifying the information to be considered in an

explanatory model examining predispositions to disruptive behaviour can only be done by listening to the young people in question and becoming familiar with their histories and contexts. It is through this qualitative approach that important contextual factors, and importantly, the young people's understanding of them, will emerge. For educational research to contribute to the developing understanding of disruptive behaviour it must do so from a position of strength and a sense of what it is capable of offering. Trying to make such research fit the criteria from a different research paradigm will result in the unique contribution of the kind described by Ungar being lost.

A lack of confidence is not the only potential barrier to multidisciplinary working;' the view of medical sciences from within education may also prove problematic. There are two areas of difficulty; the first is misunderstanding and/or misrepresentation and second is concern with the consequences of engaging with medical research.

Here it is useful to return to the characterisation of medical research offered by Purdie et al. (2002) above, that the medical approach is one which assumes a norm of behaviour, deviation from which is viewed as a result of pathology or disease requiring treatment. However, an excerpt from an article published in *Psychological Bulletin* is typical of the kinds of statements encountered in articles in the medical sciences. 'In considering neurobiological influences on behaviour, the recognition that any behaviour is the outcome of a complex interplay of individual, developmental, and social factors is important' (Van Goozen et al. 2007: 149). Indeed the literature from neurobiology, psychophysiology, psychiatry and related fields is peppered with words and phrases such as 'possibility', 'hard to interpret', 'somewhat', 'could be', 'tentative'; hardly the certainty we have been led to expect from 'scientific method'. This caution in the interpretation of data is not reflected in the representation of clinical research as found in educational literature. It does not fit with notions about the superiority of 'positivist' 'scientific' research which is presumed to be full of certainties.

It seems then that much of the anti-medical orientation may be based on a caricature of what passes as 'hard science'. Another source of resistance concerns anxiety about where engaging with the 'science' might lead. If fMRI evidence consistently identifies group differences in neural activity or structure in young people with disruptive behaviour, what has been found? There appears to be a suspicion that medics will then assert that therefore disruptive behaviour is *caused* by a neurological disorder, and significantly that this will lead to a proposed chemical solution (Davis 2006). However this does not fit with what is found in the medical and psychological literature. Rather than assuming that differences in brain structure or function must be the *cause* of a disorder, researchers appear open to possibilities – e.g. that different developmental pathways result in differences in mature brains (Oliver et al. 2000). In fact it seems probable that researchers working in the 'hard' sciences are *less* likely than those less familiar with quantitative methods to make the basic error of moving from correlation to causation. However, whilst there may not be grounds for concern that claims will be made that the 'cause' of disruptive behaviour has been identified, there may be other consequences of 'buying in' to ideas of neurobiological differences. As discussed above, one concern with the medical model is that it suggests medical solutions, and can divert attention away from other interventions.

Conclusion

A number of models for multidisciplinary work are emerging such as in social neuroscience, a new discipline that has been described as 'a new multi-level integrative analysis approach, rather than solely biological or social' (http://www.social-neuroscience.com/). However the method for combining the biological and social in an 'integrative analysis' remains unclear. Data from research based on different epistemological and ontological assumptions cannot simply be bundled together for 'integrative analysis'; they tell different stories, respond to different questions, have different understandings of truthfulness and authenticity. Whilst the terms epistemology and ontology will be familiar to most, what is required is some deeper understanding about the status of different claims to knowledge. It is for this reason that any emerging multidisciplinary networks might benefit from having at least one philosopher (or someone philosophically informed) among its

members to help guide discussion on some of the issues which have been discussed in this paper.

Here what is being argued for is the presence of someone with a specific expertise in epistemology to be involved in interdisciplinary teams. Of course whether that person would attend wearing the label 'philosopher' is not important. Indeed as Bridges (2003) has suggested, disciplinary labels and the allocation of disciplinary tasks are perhaps not the best model for a successful research group. What does seem to be important is the presence in any research team of people who are inclined (whether for reasons of personal academic biography, or personality, or some other) to ask philosophical questions 'because serious and informed engagement with the philosophical issues in educational research is part and parcel of the professional practice of the entire research group' (2002: 9). If this is indeed a requirement for an educational research team, then how much more might it be a requirement for an interdisciplinary one?

In this paper the different styles of writing which are appropriate to the different disciplines have been presented. Anyone who has published in the academic press will be familiar with a range of 'house styles' which authors must conform to if they hope to have their work published. Bridges (2009) reports the experiences of an educational researcher working on a project along with researchers from the medical sciences. When seeking publication of their findings the researcher found their work being 'impoverished by the requirements to publish in a mode which imitated medical science' (Bridges 2009:8).

A promising new addition (2007) to the list of Educational journals is *Mind, Brain and Education* which encourages submissions from 'all fields that are relevant to connecting mind, brain, and education in research, theory, and/or practice' (Wiley, 2010). However the detailed instructions to authors require that 'Investigations on experimental animals must indicate that their care was in accord with institutional guidelines.' Further, 'The style of the Publication Manual of the American Psychological Association, 5th edition, must be followed…' (Wiley 2010). These requirements clearly reveal the journal's discipline of origin. Perhaps a journal with

an editorial board which issued instruction for submissions to conform to a recognised style from the home discipline of the author(s) would help create a journal in which contributors from all fields felt equally that the journal was ‘for them’. Of course this would not be without difficulties for those responsible for the practicalities of publishing the accepted articles.

It has been argued that if educational sociologists, psychologists, neuropsychologists, psychiatrists and others are to work together, as with any professional grouping, this must be on the basis of mutual trust and respect. Some of the barriers to effective multidisciplinary working discussed above might be overcome through making explicit the assumptions at work in each discipline in order that a shared understanding (which is not necessarily the same as agreement) can be reached. Before we embark on ambitious multidisciplinary grant applications there is a prior level of preparatory groundwork which needs to be done. This might, for example, involve seminars in which researchers from all disciplines with an interest in this area could share their perspectives and the assumptions on which they are based. Just as in multidisciplinary practice, it may be that a small group of researchers with a strong commitment to making things work is the best way forward. What may be required is a greater degree of familiarisation at an individual level between people who are committed to exploring the possibilities of working across disciplines.

Albrecht, B., Banaschewski, T., Brandeis, D., Heinrich, H. & Rothenburger, A. (2005). Response inhibition deficits in externalizing child psychiatric disorders: an ERP-study with the Stop-task. *Behavioural and Brain Functions,* **1**(22).
Armstrong, T. (2006). Canaries in the coalmine: the symptoms of children labelled 'ADHD' as biocultural feedback. Chapter 2 in Lloyd, G., Stead, J. & Cohen, D. (eds). *Critical New Perspectives on ADHD.* London: Routledge.
Asahi, S., Okamoto, Y., Okada, G., Yamawaki, S., and Yokoat, N. (2004). Negative correlation between right prefrontal activity during response inhibition and impulsiveness: a fMRI study. *European Archive of Psychiatry and Clinical Neuroscience*, **254**(4), 245-251.
Avila, C., Cuenca, I., Felix, V., Parcet, M. A., & Miranda, A. (2004). Measuring impulsivity in school-aged boys and examining its relationship with ADHD and ODD ratings. *Journal of Abnormal Child Psychology,* **32**, 295–304.
Banaschewski, T., Hollis, C., Oosterlaan, J., Roeyers, H., Rubia, K., Willcutt, E., Taylor, E. (2005). Towards and understanding of unique and shared pathways in the psychophisology of ADHD. *Developmental Science*, **8**(2),132-140.
Beauregard, M. & Levesque, J. (2006). Functional magnetic resonance imaging investigation of the effects of neurofeedback training on the neural bases of selective aqttention and response inhibition in children with Attention-Deficit/Hyperactivity Disorder. *Applied Psychophysiology and Biofeedback,* **31**(1), 3-20.
Bridges, D. (2003) 'Six stories in search of a character? The role of "the philosopher" in an educational research group' in Smeyers, P and Burbules, N (eds) *The history and philosophy of the discipline of educational research,* Leuven, University of Leuven Press.
Bridges, D. (2009) 'From the Scientistic to the humanistic in the construction of the contempoaray univeristy' Keynote address International Conference in Philosophy of Education, Basel, Switzerland, Oct 29 – 31st 2009.
Bridges, D., & Smith, R. (eds) (2007). *Philosophy, methodology and educational research,* Oxford: Blackwell.
Casey, B.J. & Durston, S. (2006). From Behaviour to Cognition to the Brain and Back: What Have We Learned from Functional Imaging Studies of Attention Deficit Hyperactivity Disorder? *American Journal of Psychiatry,* **163**, 957-960.
Clark, C., Dyson, A., and Millward, A. (1998). Theorising Special Education: Time to Move on? in Clark, C., Dyson, A., and Millward, A. (eds). *Theorising Special Education,* London: Routledge.
Cohen, D. (2006). Critiques of the 'ADHD' enterprise. Chapter 1 in Lloyd, G., Stead, J. & Cohen, D. (eds). *Critical New Perspectives on ADHD.* London: Routledge.
Cole, T., Sellman, E., Daniels, H. and Visser, J. (2002). Mental Health Foundation: London, The Mental Health Needs of Young People with Emotional and Behavioural Difficulties - Bright Futures: Working with Vulnerable People, London, Mental Health Foundation.
Clark, C., Prior, M., and Kinsella, G.J. (2000). Do Executive Function Deficits Differentiate Between Adolescents with ADHD and Oppositional Defiant/ Conduct Disorder? A Neuropsychological Study Using the Six Elements Test and Hayling Sentence Completion. *Journal of Abnormal Child Psychology*, **28**(5), 403 - 414.
Collier, A. (1994). *Critical Realism: An Introduction to Roy Bhaskar's Philosophy,* London: Verso.
Cooper, P. (2006). Assessing the social and educational value of AD/HD. Chapter 32 in Hunter-Carsch, M., Tiknz, Y., Cooper, P. & Sage, R. (eds) *The Handbook of social, emotional and behavoiural difficulties*. London &New York: Continuum.

Daniels, H., T. Cole, E. Sellman, J. Sutton, J. Visser, and J. Bedward. (2003). Study of young people permanently excluded from school. *Research Report RR405*. London: DfES.
Davis, J. M., and Watson, N. (2001). Where Are the Children's Experiences? Analysing Social and Cultural Exclusion in 'Special' and 'Mainstream' schools. *Disability & Society*, **16**(5), 671 – 687.
Davis, J. M. (2006) Childhood Studies and The Construction of Medical Discourses: Questioning Attention Deficit Hyperactivity Disorder; A Theoretical Perspective Chapter ? in Lloyd, G., Stead, J. & Cohen, D. (eds). *Critical New Perspectives on ADHD.* London: Routledge.
Della Sala, S. (Ed.) *Tall tales about the Mind and Brain*. Oxford: Oxford University Press.
Department for Education (1994) *The Education of Children with Emotional and Behavioural Difficulties*, Circular 9/94, London, DfE.
DfES. (2005). Learning behaviour: The Report of the Practitioner Group on School Behaviour and Discipline. The Steer Report. London: DfES.
Ford, J., Mongon, D., and Whelan, M. (1982). *Special Education and Social Control*, London: Routledge and Kegan Paul.
Fugetta, G. P. (2006). Impairment of Executive function in Boys with Attention deficit/Hyperactivity Disorder. *Child Neuropsychology*, **12**(1), 1-21.
Green, A. (1994). Postmodernism and State Education. *Journal of Education Policy*, **9**(1), 67-83.
Griffiths, M. and MacLeod, G., 2008 Personal Narratives and Policy: Never the Twain? Journal of Philosophy of Education, **42** s1, 121-143.
Hallam, S., Castle, F., Rogers ,L., Creech, A., Rhamie, J. and Kokotsaki, D. (2005) Research and Evaluation of the Behaviour Improvement Programme. *Research Report RR702*. DfES: London.
Hallam, S., Rhamie, J. and Shaw, J. (2006) Evaluation of the Primary Behaviour and Attendance Pilot. Research Report RR717. London: DfES.
Hershey, T., Black, K.J., Hartlein, J., Braver, T.S., Barch, D.M., Carl, J.L. & Perlmutter, J.S. (2004). Dopaminergic modulation of response inhibition: an fMRI study. *Brain Res Cogn Brain Res.* **20**, 438–448. doi:10.1016/j.cogbrainres. 2004.03.018
Howard Jones, P. (2009). *Introducing Neuroeducational Research*, London: Routledge.
Jacobsen, K. (2002). ADHD in Cross-Cultural Perspective: Some Empirical Results. *American Anthropologist*, **104**(1), 283 – 286.
Jonsdottir, S., Bouma, A., Sergeant, J.A., Scherder, E.J.A. (2006) Relationships between neuropsychological measures of executive function and behavioral measures of ADHD symptoms and comorbid behavior. *Archives of Clinical Neuropsychology*, **21**(5).
Kane, J., Lloyd, G., McCluskey, G., Riddell, S., Stead, J. & Weedon, E. (2006). Restorative Practices in Three Scottish Councils (an evaluation funded by the Scottish Executive Education Department. Final report). Edinburgh: SEED.
Keenan, K. & Wakschlag, L. (2000). More than the terrible twos: The nature and severity of disruptive behavior problems in clinic-referred preschool children. *Journal of Abnormal Child Psychology*, **28**, 33-46.
Kenemans, J.l., Bekker, E.M., Lijffijt, M., Overtoom, C.C.E., Jonkman, L.M., & Verbaten, M.N. (2005). Attention deficit and impulsivity: Selecting, shifting, and stopping. *International Journal of Psychophisiology*, **58**(1), 59-70.

Klorman, R., Hazel-Fernandez, L.A., Shaywitz, S.E., Fletcher, J.M., Marchione, K.E., Holahan, J.M., Stuebing, K.K. & Shaywitz, B.A. (1999). Executive functioning deficits in Attention -Deficit/Hyperactivity Disorder are independent of Oppositional Definat or Reading Disorder. *Journal of the American Academy of Child &Adolescent Psychiatry*, **38**(9), 1148-1155.
Laws, C. & Davies, B. (2000). Poststructuralist Theory in Practice: Working with 'Behaviourally Disturbed' Children. *Qualitative Studies in Education*, **13**(3), 205-201.
Lloyd, G. (2003) 'Listening not Labelling. Responding to Troubled and Troublesome Students', *International Journal of School Disaffection*, **1** (1), 30-34.
Lloyd, G. & Norris, C. (1999). Including ADHD? *Disability and Society*, **14**(4), 505-517.
Lloyd, G., Stead, J. & Cohen, D. (eds) (2006). *Critical New Perspectives on ADHD.* London: Routledge.
McCarthy, T. (1990). The Critique of Impure Reason: Foucault and the Frankfurt School. *Political Theory*,**18**(3), 437-469.
Macleod, G. & Munn, P. (2004). Social, Emotional and Behavioural Difficulties: A Different kind of Special Educational Need? *Scottish Educational Review*, **36**(2), 169-176.
Macleod, G. (2006). Bad, mad or sad: constructions of young people in trouble and implications for interventions. Emotional and Behavioural Difficulties, **11**(3), 155-167.
Milbourne, L. (2005). Children, Families and Inter-Agency Work: Experiences of Partnership Work in Primary Education Settings, *British Educational Research Journal*, **31** (6) 675-695.
Moore, R. & Muller, J. (1999). The Discourse of 'Voice' and the Problem of Knowledge and Identity in the Sociology of Education. *British Journal of Sociology of Education*, **20**(2).
Mueller, S.C., Jackson, G.M., Dhalla, R., Datsopoulos, S. and Hollis, C.P. (2006) Enhanced Cognitive Control in OYoung People with Tourette's Syndrome *Current Biology* 16(6) 570-573.
Munn, P., Johnstone, M., & Sharp, S. (2004). *Discipline in Scottish schools: A comparative survey over time of teachers' and headteachers' perceptions. Final Report to SEED*. Edinburgh: SEED.
Niiniluoto, I. (1999). *Critical Scientific Realism*. Oxford: OUP.
O'Brien, T. (2005) 'Social, Emotional and Behavioural Difficulties' in Lewis, A. and Norwich, B. (eds) *Special Teaching for Special Children?: Pedagogies for inclusion*, Maidenhead, Berkshire, Open University Press.
Oliver, A., Johnson, M.H., Karmiloff-Smith, A. & Pennington, B. (2000). Deviations in the emergence of representations: A neuroconstructivist framework for analysing developmental disorders. *Developmental Science*, **3**,1–23.
Oosterlann, J., Logan, G.D. & Sergeant, J.A. (1998). Response inhibition in AD/HD, CD, Comorbid AD/HD+CD, Anxious, and control children: A meta-analysis of studies with the stop task. *Journal of Child Psychology and Psychiatry*, **39**(3), 411-425.
Oosterlaan, J. & Sergeant, J.A. (1998). Effects of reward and Response Cost on response Inhibition in AD/HD, Disruptive, Anxious and Normal Children. *Journal of Abnormal Child Psychology*, **26**(3): 161-174.
Paechter, C. & Weiner, G. (1996). Editorial. *British Educational Research Journal*, **22**(3), 267 – 271.

Pirrie, A., MacLeod, G., Cullen, M.-A. and McCluskey, G., (2009) Where Next? for pupils excluded from special schools and PRUs Final Report for the DCSF. http://www.dcsf.gov.uk/research/programmeofresearch/projectinformation.cfm?projectId=14862&type=5&resultspage=1 (accessed online 9.1.10)
Pliszka, S.R., Glahn, D.C., Semrud-Clikeman, M., Franklin, C, Perez, R., Xiong, J., Liotti, M. (2006). Neuroimaging of Inhibitory Control Areas in Children With Attention Deficit Hyperactivity Disorder Who Were treatment Naïve or in Long-Term treatment. *American Journal of Psychiatry*, **163**, 1052-1060.
Polanczyk, G., de Lima, M.S., Horta, B.L., Biederman, J., Rohde, L.A. (2007). The worldwide prevalence of ADHD: A systematic review and metaregression analysis. *Arch Gen Psychiatry*, **64**, 218-224.
Pring, R. (2000). The 'False Dualism' of Educational Research. *Journal of Philosophy of Education*, **34**(2), 247 – 260.
Purdie, N., Hattie, J. & Carroll, A. (2002). A review of the research on interventions for attention deficit hyperactivity disorder: what works best? *Review of Educational Research*, **72**, 61-99.
Quay, H.C. (1997). Inhibition and Attention Deficit Hyperactivity Disorder. *Journal of Abnormal Child Psychology*, **25**(1), 7-13.
Rowbottom, D.P., & Asiton, S.J. (2007). The myth of 'scientific method in contemporary educational research. Chapter 2 in Bridges, D., & Smith, R. (eds) (2007). *Philosophy, methodology and educational research,* Oxford: Blackwell.
Rubia, K., Taylor, E., Smith, A. B., Oksannen, H., Overmeyer, S. & Newman, S. (2001). Neuropsychological analyses of impulsiveness in childhood hyperactivity. *British Journal of Psychiatry*, **179**, 138-143.
Schatzberg, A.F. (2010) 'Why is *DSM-5* Being Delayed?' *Psychiatric News*,**45** (1), 3, http://pn.psychiatryonline.org/content/45/1/3.full (accessed online 9.1.10)
Scott, D. (2005). Critical Realism and Empirical Research Methods in Education. *Journal of Philosophy of Education*, **39**(4), 633-646.
Sergeant, J.A., Geurts, H., & Oosterlaan, J. (2002). How specific is a deficit of executive functioning for Attention-Deficit/Hyperactivity Disorder? *Behavioural Brain Research*, **130**, 3-28.
Slee, R. (1995). *Changing Theories and Practices of Discipline.* London & Washington: Falmer Press.
Sloper, P. (2004). 'Facilitators and barriers for co-ordinated multi-agency services' in *Child: Care, Health and Development*, (**30**) 6, 571-80.
Singer, H. S., and Minzer, K. (2003) Neurobiology of Tourette's syndrome: concept of neuroanatomic localization and neurochemical abnormalities *Brain and Development* 25 (supplement 1) s70-s84.
Smith, A, B., Taylor, E., Brammer, M., Toone, B., Rubia, K. (2006). Task-specific Hypoactivation in Prefrontal and Temporoparietal Brain Regions During Motor Inhibition and Task Switching in Medication-Naïve Children and Adolescents with Attention Deficit Hyperactivity Disorder. *American Journal of Psychiatry*, **163**, 1044-1051.
Smith, P., O'Donnell, L., Easton, C. and Rudd, P. (2007) Secondary Social, Emotional and Behavioural Skills (SEBS) Pilot Evaluation. *Research Brief DCSF-RB003.* London: DCSF
Soles, T., Bloom, E., Lee Heath, N. and Karagiannakis, A. (2008) An exploration of teachers' current perceptions of children with emotional and behavioural difficulties. *Emotional and Behavioural Difficulties*, **13** (4), 275 – 290.
Swedo, S. (2009) Report of the DSM-V Neurodevelopmental Disorders Work Group

http://www.psych.org/MainMenu/Research/DSMIV/DSMV/DSMRevisionActivities/DSM-V-Work-Group-Reports/Neurodevelopmental-Disorders-Work-Group-Report.aspx (accessed online 9.1.10)
Tait, G. (2003). Free will, moral responsibility and ADHD. *International Journal of Inclusive Education*, **7**(4), 429 – 446.
Tait, G. (2006). A brief philosophical examination of ADHD. Chapter 5 in Lloyd, G., Stead, J. & Cohen, D. (eds) (2006). *Critical New Perspectives on ADHD.* London: Routledge.
Thapar, A., O'Donovan, M., & Owen, M. J. (2005). The genetics of attention deficit hyperactivity disorder. *Human Molecular Genetics*, **14** (suppl 2): R275-R282.
Tomlinson, S. (1982). *A Sociology of Special Education.* London: Routledge and Keegan Paul.
Ungar, M. (2003). Qualitative contributions to resilience research. *Qualitative Social Work*, **2**(1), 85-102.
Vaidya, C.J., Bunge, S. A., Dudukovic, N.M., Zalecki, C.A., Elliot, G.R., Gabrieli, J.D.E. (2005) Altered Neural Substrates of Cognitive Control in Childhood ADHD: Evidence from Functional Magnetic Resonance Imaging *American Journal of Psychiatry* 162: 1605-1613.
Van Goozen, S.H.M., Cohen-Kettenis, P.T., Snoek, H., Matthys, W., Swaab-Barnveld, H. & Van Engeland, H. (2004). Executive functioning in children: a comparison of hospitalised ODD and ODD? ADHD children and normal controls. *Journal of Child Psychology and Psychiatry*, **45**(2), 284-298.
Van Goozen, S.H.M., Fairchild, G., Snoek, H. & Harold, G.T. (2007). The evidence for a neurobiological model of childhood antisocial behaviour, *Psychological Bulletin*, **133** (1), 149-182.
Wiley (2010) 'Wiley-Blackwell: Mind Brain and Education', http://www.wiley.com/bw/submit.asp?ref=1751-2271&site=1 (accessed online 9.1.10)
Willis, P. E. (1977). *Learning to Labour: How Working Class Kids get Working Class Jobs*, Hampshire: Gower.